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Finance and Policy

Massachusetts Health Care Cost Trends

Efficiency of Emergency Department Utilization in Massachusetts

Appendix A. Data and Methodology

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DIVISION OF
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Appendix A - Data and Methodology

The data for this report include all emergency department visits, including Satellite Emergency Facility visits, by patients whose visits resulted in neither an outpatient observation stay nor an inpatient admission at the reporting facility. These data provide visit level information for patients who present at the ED and who are discharged as outpatients within 24 hours. The study utilizes data from all Massachusetts residents who visited an acute hospital Emergency Department site from the fiscal year 2006 to the fiscal year 2010. The study population includes patients who presented at the ED and were discharged as outpatient within 24 hours between October 1st, 2005 and September 30th, 2009. This data is submitted by hospitals to the Division of Health Care Finance and Policy (DHCFP) pursuant to 114.1 CMR 17.00. The unit of analysis is the emergency department visit rather the patient; therefore, multiple ED visits per patient are counted individually. The ED data contain information on patient characteristics (age, race/ethnicity, and gender), the hospital that provided the services, charges, procedures and diagnoses. Patients' income, educational status, or other socioeconomic information were not available in the dataset.

Since ED data only contain hospital charges, not payment or price information, the charge information was used to estimate resource cost. The hospital-specific CCR is a ratio of hospital emergency department expenses including capital to gross hospital emergency department revenue. This ratio is obtained from each hospital's 403 cost reports submitted to DHCFP annually. The state-wide cost to charge ratio (CCR) for the ED is calculated by applying an individual hospital's CCR18 to its ED charges to estimate a hospital-specific ED costs and then dividing the sum of ED costs from MA hospitals by the total charges reported in the ED data (Table A.1).

Table A.1 Statewide Cost-to-Charge Ratios (CCR) for the emergency department, FY 2006-2010

	2006	2007	2008	2009	2010
Cost-to-Charge Ratio	0.359	0.344	0.348	0.344	0.345

The statewide CCRs for the ED are then applied to the statewide ED charge data to estimate aggregate costs that are analyzed in this report.

This report utilizes an Emergency Department Algorithm developed by John Billings and colleagues at New York University in 2001. The main purpose of the NYU ED Algorithm is to identify emergency department visits for primary care treatable conditions - i.e., visits that could have been provided in primary care setting or emergencies that could have been avoided if primary care had been delivered at earlier stage of illness.

According to the NYU ED Algorithm background paper published by NYU Center for Health and Public Service Research, the ED Algorithm classifies visits into four categories:[1]

(1) Non-emergency visits, such as sore throat and where immediate medical care was not required within 12 hours;

(2) Emergency but primary care treatable conditions where treatment is required within 12 hours but could have been treated in a primary care setting (e.g., CAT scan or certain lab tests);

(3) Visits that require ED care but could have been avoided with better primary care (e.g. the flare up of asthma, diabetes etc.); and

(4) Visits that require ED care and could not have been avoided (e.g., heart attack).

Taken together, visits considered non-emergency, emergency but primary care treatable, and emergency where ED care was necessary but avoidable, are referred to as preventable/avoidable ED visits.

Since its creation, there has been no update to the NYU ED Algorithm to account for the annual revision of ICD-9 codes. As a result, DHCFP found that the unclassified visit category was the fastest growing category over time, thereby distorting the trend for all other categories. In 2008, with assistance from Peter B. Smulowitz MD, MPH, Attending Physician, Department of Emergency Medicine at Beth Israel Deaconess Medical Center, the Division reclassified the most significant group of ICD-9 codes that fell into the unclassified category using the same basic logic used by Billings. The adjustment method was also reviewed by Mr. Billings.

It is widely acknowledged that the NYU ED Algorithm has the potential to be a powerful tool for health service researchers. The NYU ED Algorithm has been adopted for use by the Centers for Disease Control and Prevention (CDC) "to describe the characteristics of high safety-net burden EDs and has been used by several states, including Massachusetts, to track ED visit patterns."[2] A study by Ballard et. al. (2010) validated the utilization of the NYU ED classification algorithm in identifying groups of ED visits likely to be appropriate or inappropriate for the emergency department.[3] The software for the algorithm is made publicly available by the Agency for Healthcare Research and Quality (AHRQ).[4]

1 For more information about the NYU ED Algorithm, please visit http://wagner.nyu.edu//chpsr/index.html?p=62

2 Lowe, R.A. & Fu, R. (2008). Can the emergency department algorithm detect changes in access to care? ACAD Emerg Med, 15(6), 506-516

3 Ballard, D.W., Price, M., Fung, V., Brand, R., Reed, M.E., Fireman, B., Newhouse, J.P., Selby, J.V., & Hsu, J. (2010). Validation of an algorithm for categorizing the severity of hospital emergency visits, Med Care, 48(1), 58-63.

4 Agency for Health Care Research and Quality (2004). Archive: Safety Net Monitoring: Interactive Tool and Software. http://archive.ahrq.gov/data/safetynet/toolsoft.htm/ Accessed 01/18/2012.

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